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SHORT REPORT

A Case Report of an Abnormal Configuration of the Branches of Aortic Arch with an Internal Carotid Artery Aneurysm

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We report a rare case of an abnormal configuration of the aortic arch branches. The first branch of aortic arch was as normal right brachiocephalic artery. The second branch was an internal carotid artery originating directly from the aortic arch, not from the left common carotid artery. This internal carotid artery had an extracranial aneurysm at the level of the third cervical vertebra. The last branch was a common trunk of the left external carotid and left subclavian artery. The internal carotid artery aneurysm was succesfully resected.

Keywords: Carotid artery anomalies; Aneurysm; Aberrant internal carotid artery; Aortic arch.

Case Report

A 38-year-old woman was referred to our clinic with pharyngeal pain and pulsative mass in her neck. She felt foreign body sensation in her throat. There was no past history of infection or trauma. A $4\times5\,cm^2$ swelling could be palpated in pharyngeal region of her neck. Neurological examination was normal. A Magnetic Resonance Angiography (MRA) showed a large extra-cranial aneurysm of the left internal carotid artery (ICA) and a congenital variation of the branches of aortic arch. The first branch of aortic arch was as normal right brachiocephalic artery. The second branch was an ICA originating directly from the aortic arch. The last branch was a common trunk of the left external carotid and left subclavian artery. There was no left common carotid artery. The left ICA had an extracranial aneurysm at the level of the third cervical vertebra. Under general anaesthesia, the aneurysm was approached directly. The aneurysm was resected and ICA was repaired with an end-to-end anastomosis. Surgical and pathological findings indicated a true aneurysm. The ICA was patent in postoperative MRA (Fig. 1). Postoperative course was uneventful. The patient was discharged on the seven postoperative days. At the patient's 2-year postoperative evaluation, he was asymptomatic and without clinical and ultrasound evidence of local recurrence.

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Discussion

In about 80% of individuals, three branches originate from the aorta arch: the brachiocephalic trunk, left common carotid artery, and left subclavian artery.[1] Branches originating from the aortic arch may show different configurations. These configurations have been classified by Adachi.[2] We report an undescribed a variant. In our case, there was no left common carotid artery. The left ICA originated directly from the aortic arch. Furthermore, the left subclavian artery and left external carotid artery arose from a common trunk. Finally, the left ICA had a large aneurysm. The anatomic and morphologic variations of the aortic arch branches are important for diagnosis and surgical procedures in the head and neck region. In our case, the left internal carotid artery, left external carotid artery and left subclavian artery had an aberrant origin, but the anatomical courses of these arteries

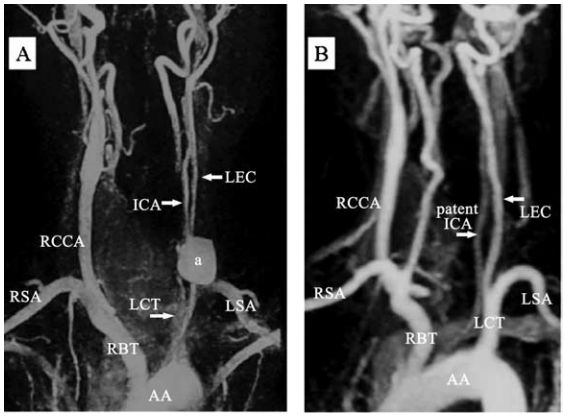

Fig. 1. A. Preoperative magnetic resonance angiography showing aneurysm of internal carotid artery aneurysm. B. Postoperative magnetic resonance angiography view depicts the patent internal carotid artery and aortic arch anomalies. ICA, internal carotid artery; a, aneurysm; AA, aortic arch; LCT, left common trunk; RCCA, right common carotid artery; RSA, right subclavian artery; RBT, right brachiocephalic trunk; LSA, left subclavian artery; LEC, left external carotid.

were normal. An ICA aneurysm is rare and can be life-threatening. Our patient had no symptoms, except pain and swelling associated with her left ICA aneurysm. She had no neurological symptoms. The main causes of aneurysm formation may be classified as constitutional vessel weakness, atherosclerosis, fibromuscular dysplasia, congenital defects, infections, and trauma. The cause in our patient is not known. Our patient had a saccular aneurysm. Welling reported that 41 of 1118 aneurysm of the peripheral arteries were extra-cranial carotid artery aneurysms.[3] Only four of them were saccular aneurysms of the ICA. The potential risks of an aneurysm of the ICA warrant surgical treatment. According to our knowledge this is the first report of a large extra-cranial aneurysm of the ICA and associated with an anatomical variation of the branches of aortic arch.

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